SCIENCE of Scrapbooking

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Preservation Q&A

The terms acid-free and photo-safe are not synonymous. Acid-free doesn't necessarily mean that the product is any safer for photos than another.

Q: HOW DO MANUFACTURERS DETERMINE IF SOMETHING IS PHOTO-SAFE?

A: I often see the words photo-safe on packages of scrapbook products and wonder to myself, "Exactly what do they mean by that?" For museums and archives the term photo-safe usually means that a product has met a specific set of standards for composition and/or performance indicating its long-term inertness with photographic materials. With scrapbook products there is no clear indication that these sorts of composition and/or performance standards have been applied. In fact, in many cases it appears that the term photo-safe is nothing more than a hope on the part of the manufacturer. I suspect, and maybe you do to, that many companies rely on the myth that if a product is acid-free then it must be photo-safe.

IN REALITY, THE TERMS ACID-FREE AND photo-safe are not synonymous. Acid-free doesn't necessarily mean that the product is any safer for photos than another that is slightly acidic. Surprised? In fact, some of the manufacturers of these products can't even tell you what causes a photo to fade or yellow over time. So how do you know if a manufacturer knows how to make a product that doesn't harm photos or even understands what causes photos to fail? How can they prove it to you?

FIRST, WHAT CAUSES A PHOTOGRAPH TO FAIL OVER THE LONG-TERM?

This doesn't include those things that cause harm over the short term like fire, flood, or mishandling. The three primary deterioration forces for photos are heat, moisture and pollution. You probably noticed that scrapbook products were not included on the list. Actually they were, as pollution. Don't get angry because I'm comparing some scrapbook materials to smog. The reality is that smog and some scrapbook products can harm photos in exactly the same way. First, let's discuss heat. The amount of heat a scrapbook is exposed to is measured as temperature. Increases in temperature increase the rates at which scrapbooks and photos deteriorate. Scrapbook products cannot reduce the amount of heat that the photos inside the album are exposed to. The only way to control the effects of heat is to lower the temperature of the storage environment.

The last big cause of photo deterioration is pollution. A well-known producer of scrapbook pollution is lignin in paper and paperboard.

Moisture in the air is the second cause of photo deterioration and is measured as humidity or relative humidity. It can accelerate the reactions caused by heat and pollution, or it can cause the gelatin layer on photos to become gooey and stick to other photos, page protectors, or the glass in frames. Scrapbook products can do little to reduce the amount of moisture or heat reaching the photos inside. The only way to control the effects of moisture is to lower the humidity of the storage environment.

The last big cause of photo deterioration is pollution. Pollution comes from both the air (smog, etc.) and potentially from some scrapbook materials we use. A well-known producer of scrapbook pollution is lignin in paper and paperboard. This is why you often see the term

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No scrapbook products can save your photos from a poor storage environment.

HERE ARE A FEW POINTS TO REMEMBER REGARDING PHOTO SAFETY:

- When purchasing raw materials to make your products or when purchasing manufactured items to sell in your store, make sure supplier claims of photo-safety can be backed up with test results.
- Don't allow manufacturers or sellers to convince you that they don't need to do the appropriate testing because they already have a long history of making quality products.
- Don't let manufacturers or sellers convince you that because their products are not meant to be in direct contact with a photo (like box materials) that they don't need to be tested. That isn't true.
- Don't assume acid-free means lignin-free or that either of these terms means photo-safe.
- Don't assume that if something is photo-safe it is generally scrapbook-safe. Products that are safe for photos may still interact or fail in other ways like adhesives turning paper yellow or journaling inks fading away.

lignin-free on packages (but lignin-free isn't synonymous with acid-free or photo-safe). Lignin itself can't jump out of paper and hurt a photograph, but over time it naturally breaks down into acids and oxidizing, reducing, and discoloring agents. It is these four things that harm our photos. Incidentally, smog contains these same four types of pollution. Besides paper, scrapbook pollutants can come from a variety of other products: adhesives, plastics, inks, and embellishments.

HOW DO WE MAKE SCRAPBOOK PRODUCTS THAT WON'T HARM PHOTOS?

It seems sensible that to make a product that isn't harmful to photos over time, all a company has to do is make sure the product doesn't emit pollutants. However, given the complexity of product chemistries and the various needs for manufacturing, it isn't always so easy. It is also unknown whether there must be absolutely none of these pollutants or if there are allowable levels that won't compromise photo-safety and even improve product performance in other ways. This is where having a way to show photo-safety through testing may help.

Currently, the best way I know to demonstrate that a material won't harm photos is through the use of standardized test methods that can monitor product performance and/or composition. An example of a standard test method is the Technical Association of the Pulp and Paper Industry's (TAPPI) T 509 Hydrogen ion concentration (pH) of paper extracts (cold extraction method). This is one of the standard tests in the paper industry to determine paper pH (acidity). Some very large companies have their own internal testing departments. Their professional staffs could potentially look at various product performance and composition issues such as pH, but usually their work is directed at initial product performance (how well does this pen write) and store shelf life (how soon will this glue need to be sold). Some of these companies may occasionally look at the long-term stability of their products, but the reality is that many of the large companies and most of the smaller companies have little scientific evidence to establish their products are long-lasting or safe for photos.

The standards that exist have slowly been gaining momentum among manufacturers and sellers of scrapbook products. Here are the International Organization for Standardization (ISO) standards for imaging materials and photographic materials. ISO 18902 is entitled *Imaging Materials-processed photographi films, plates, and papers; Filing enclosures and storage containers*. ISO 14523 is entitled *Photography: Processed Photographic Materials-photographic activity test for enclosure materials.*

Both standards use the term enclosure(s) in their titles. This is what professional conservators would call scrapbooking materials because these products "enclose" photos (they would not include decorative elements like stickers and other embellishments). The ISO 18902 document can be very helpful in its description of the various materials used for photo storage, and it gives many tips for product compositions. For example, it recommends using polypropylene, polyethylene, and polyester plastics in favor of PVC's. It also has recommendations for pH levels in papers. Unfortunately for you, it was written for institutional application and often doesn't translate well to the needs of the scrapbooker at home. It requires all adhesives to be reversible, which, in our craft, we don't always do. Also there is no helpful information regarding any of the decorative embellishments you put on your pages.

Opposite Page and Left: *All three of these photos display the effects of water damage.*

Above: *Various pollutants can yield odd results, as seen in this red-tinted photo.*

Bottom: *Mold, caused by poor storage conditions, can affect photos and scrapbook pages themselves.*

Pollution and humidity can cause irreversible damage to original photos or scrapbook pages over time. Selling materials that have passed standardized testing methods goes a long way toward preserving important photos and documents.

The ISO 14523 document describes the Photographic Activity Test, commonly referred to as the PAT. This test can specifically screen products for the oxidation, reduction, and discoloration reactions caused by scrapbook pollutants. Basically, the test artificially ages scrapbook products in contact with special detectors that represent photographs and then uses measured changes to determine if those scrapbook products are safe or not. The result is a simple pass or fail rating. Because the PAT doesn't tell you anything about the product's acidity level or lignin-content, pH and lignin content should also be indicated.

No scrapbook products can save your photos from a poor storage environment. If it's hot and humid where your photos are stored, you could be shortening the lifespan of your photos by half or more. Keep them cool and dry!

Daniel Burge is a Research Scientist at the Image Permanence Institute at the Rochester Institute of Technology. He has been investigating the potentially harmful interactions between photo storage products and photographs for the last 12 years. He is also active as a member and educator in the Scrapbook Preservation Society.